



# MARSHALL STAR

Serving the Marshall Space Flight Center Community

Jan. 12, 2006

## NASA Administrator Griffin honors Hurricane Katrina heroes

By Sanda Martel

NASA honored 38 employees with one of its highest honors during an awards ceremony Jan. 5 at the Michoud Assembly Facility, east of New Orleans.

NASA Administrator Michael Griffin presented Exceptional Bravery Medals to hurricane "ride-out" team members for protecting the facility responsible for the space shuttle external fuel tanks and for saving the Space Shuttle Program from massive delays.

"Their courage reminds us that not all of NASA's heroes fly in space," said the administrator.

The team volunteered to "hunker down" inside Michoud as powerful Hurricane Katrina approached the Gulf Coast in the early morning hours of Aug. 29. They stayed inside the facility where space shuttle external fuel tanks are built and processed to protect the valuable spaceflight hardware.

*See Heroes on page 3*

In left photo, Marshall team member Ernest Graham, center, receives an award from NASA Administrator Mike Griffin and NASA Deputy Administrator Shana Dale. In right photo, participating in the ceremony are from left, Marshall Byrd, Michoud vice president; David King, Marshall director; Bill Gerstenmaier, Space Ops associate administrator; Shana Dale; and Mike Griffin.



## NASA Administrator Mike Griffin speaks at Huntsville Chamber of Commerce 70th annual membership meeting



NASA Administrator Mike Griffin, right, chats with Konrad Dannenberg, an original Wernher von Braun team member, at the Chamber of Commerce of Huntsville/Madison County luncheon Jan. 6. Todd May of the Science and Mission Systems Office looks on. Griffin was the featured speaker at the Chamber's 70th annual membership meeting. The event took place at the Von Braun Center. More than 1,200 people attended.

Administrator Griffin also conducted a town hall meeting with the Marshall workforce during his visit to Huntsville.

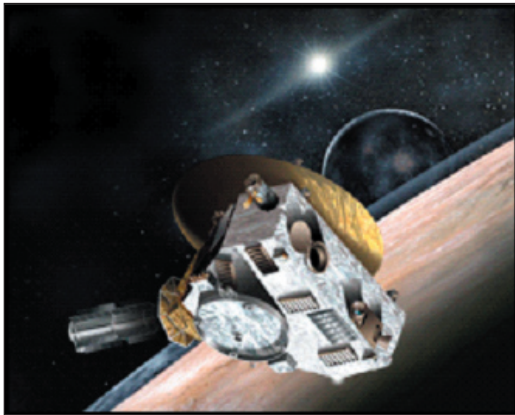
Launch window begins Jan. 17

## NASA sets sights on first Pluto mission

*From Johns Hopkins University Applied Physics Laboratory*

NASA is preparing to launch the first spacecraft to distant Pluto and its moon Charon. The January launch of New Horizons will complete the initial reconnaissance of the planets in the solar system.

New Horizons is the first in NASA's New Frontiers program of medium-class planetary missions. The Discovery and New Frontiers Program Office at the Marshall Center has been tasked to



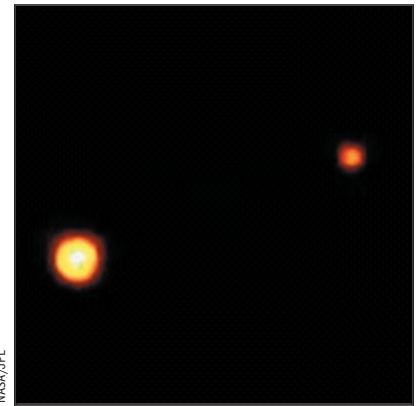
Artist's concept of the New Horizons spacecraft during its planned encounter with Pluto and its moon Charon.

manage the New Frontiers program for NASA Headquarters' Science Mission Directorate. Program management includes responsibilities for project planning, development, launch, mission operations and ongoing assessments to enhance mission success using risk-based insight.

"After it arrives at Pluto — more than 10 years from now — New Horizons will conduct a five-month-long study of Pluto and its primary moon Charon," said Allen Bacskay, the Discovery and New Frontiers Program Office mission manager for New Horizons.

"This is the first-ever mission to Pluto, which offers an interesting opportunity to glean new information," Bacskay added. "What is the planet's surface temperature? How do its atmosphere and geology compare to Earth's? What can we learn about its newly discovered moons? These are just a few of the mysteries that could be solved by this mission."

"New Horizons will study a unique world, and we can only imagine what we may learn. This is a prime example of scientific missions that complement the Vision for Space Exploration," said Mary Cleave, associate administrator for NASA's Science Mission Directorate.



Pluto, left, and its moon, Charon, as seen by NASA's Hubble Space Telescope.

## Early launch could shave five years off Pluto mission

*By Sherrie Super*

It sounds like a mathematical story problem. If a train from Huntsville leaves two hours early, how many hours early does it arrive in Birmingham? On Earth, the answer is simple — two hours. But when it comes to space travel, the answer isn't so simple.

For New Horizons, an early launch date could trim years off the mission duration. The launch window begins Jan. 17 and extends through Feb. 14. However, a launch before Feb. 3 will allow the spacecraft to get a boost from the largest planet in our solar system, Jupiter.

Due to planetary movements, a launch before this date will position the spacecraft to fly past Jupiter in early 2007. Using the giant planet's gravity, New Horizons can get a slingshot-type boost toward Pluto. The Jupiter flyby would trim the trip to Pluto by five years.

With an early launch date, New Horizons could reach the Pluto system as early as mid-2015.

*The writer, an ASRI employee, supports the Public and Employee Communications Office.*

## Pluto: a mysterious, icy planet

*By Sherrie Super*

New Horizons will be the first spacecraft to visit Pluto. Unlike our solar system's inner, rocky planets like Earth or its outer gas giants like Jupiter, Pluto is known as an "ice dwarf."

The smallest planet in our solar system, Pluto is about one-fifth the diameter of Earth. Pluto's primary moon Charon is only slightly smaller than the planet it orbits.

Pluto may be the largest object in the Kuiper Belt, a disk-like zone beyond Neptune's orbit. This distant region — containing thousands of icy objects at least 620 miles in diameter — is believed to be the source of some comets.

Because of Pluto's great distance from the sun — nearly 40 times farther than Earth — Pluto's surface may reach temperatures as low as -400°F. Pluto takes 248 years to orbit the sun and more than six days to complete one planetary rotation.

Discovered in 1930, Pluto remained shrouded in mystery until advanced optical tools such as NASA's Hubble Space Telescope shed new light on the distant, icy planet. The next leap in knowledge is expected when New Horizons reaches the outer fringes of our solar system. From Earth, the trip will take at least 10 years.

*The writer, an ASRI employee, supports the Public and Employee Communications Office.*

## NASA prepares for return of Stardust

*From NASA's Jet Propulsion Laboratory*

NASA's Stardust mission is nearing Earth after a 2.88 billion mile round-trip journey to return cometary and interstellar dust particles back to Earth. Scientists believe the cargo will help provide answers to fundamental questions about comets and the origins of the solar system.

Stardust is part of NASA's Discovery Program of lower cost, scientifically focused exploration projects. The Science Mission Directorate at NASA Headquarters in Washington has assigned the program management responsibilities for the project formulation, development, launch, mission operations and risk assessments to the Marshall Center's Discovery and New Frontiers Program Office.

The velocity of the sample return capsule, as it enters Earth's atmosphere at 28,860 mph, will be the fastest of any human-made object on record. It surpasses the record set in May 1969 during the return of the Apollo 10 command module. The capsule is scheduled to return Jan. 15.

"Comets are some of the most informative occupants of the solar system. The more we can learn from science exploration missions like Stardust, the more we can prepare for human exploration to the moon, Mars and beyond," said Dr. Mary Cleave, associate administrator for NASA's Science Mission Directorate.

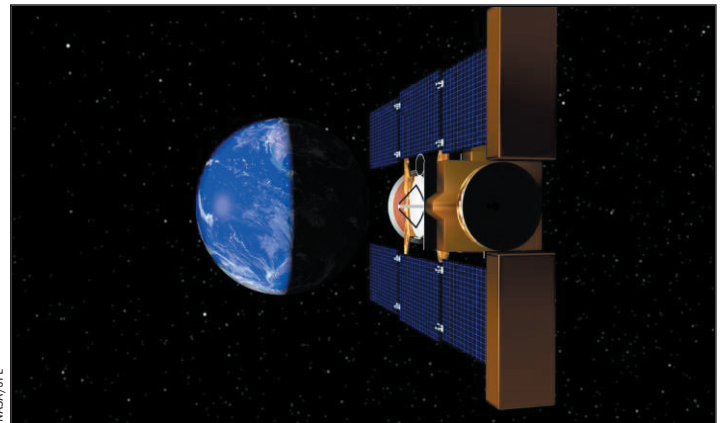
At 11:57 p.m. CST Jan. 14, Stardust will release its sample return capsule. Four hours later, the capsule will enter Earth's atmosphere 410,000 feet over the Pacific Ocean. The capsule will release a

drogue parachute at approximately 105,000 feet. Once the capsule has descended to about 10,000 feet, the main parachute will deploy. The capsule is scheduled to land at 4:12 a.m. CST Jan. 15.

NASA expects most of the collected particles to be no more than a third of a millimeter across. Scientists will slice these particle samples into even smaller pieces for study.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Stardust mission for NASA's Science Mission Directorate. Lockheed Martin Space Systems of Denver developed and operates the spacecraft.

*Sherrie Super, an ASRI employee, contributed to this report. Super supports the Public and Employee Communications Office.*



Artist's concept of Stardust approaching Earth.

## Pluto

***Continued from page 2***

The Vision for Space Exploration is a bold new course into the cosmos, a journey that will return the space shuttle safely to flight, complete the construction of the International Space Station, take humans back to the moon and eventually to Mars and beyond.

The New Horizons spacecraft was designed and built at the Johns Hopkins University Applied Physics Laboratory, Laurel, Md. Pending approval, New Horizons is set to launch from Cape Canaveral Air Force Station, Fla., no earlier than Jan. 17. The launch window extends until Feb. 14.

The compact, 1,050-pound, piano-sized probe will launch aboard

an Atlas V expendable launch vehicle, followed by a boost from a kick-stage solid propellant motor. New Horizons will be the fastest spacecraft ever launched, reaching lunar orbit distance in just nine hours and passing Jupiter 13 months later. Depending on its launch date, New Horizons could reach the Pluto system as early as mid-2015.

The spacecraft will "sleep" in electronic hibernation for much of the cruise to Pluto. The spacecraft will send back a beacon signal each week to give operators an instant read on spacecraft health. The entire spacecraft, drawing electricity from a single radioisotope thermoelectric generator, operates on less power than a pair of 100-watt household light bulbs.

*Sherrie Super, an ASRI employee, contributed to this report. Super supports the Public and Employee Communications Office.*

## Heroes

***Continued from page 1***

Their efforts were critical not only to NASA's Space Shuttle Program, but also to the future of human space flight. Michoud's unique manufacturing facilities figure prominently in America's Vision for Space Exploration, because derivatives of the external tank are part of the design for the next generation spacecraft.

Michoud employees honored with medals are Ronald Adams, Joseph Barrett, Donald Bollich, Fred Castle, Dan Doell, John Fisher, James

Ford, Stephen Francis, Monroe Frazier, Ernest Graham, William Hale, Willie Henderson, Paul Herrin, Royal Holland, Guy Jackson, Ivory Jordan, Joe Kennedy, Donald Leon, Michael Moore, Daryl Ordes, Michael Parquet, John Pucheu, George Rogers, Steven Roshto, Alan Rovira, Joan Savoy, Vickie Schmersahl, Patrick Shea, Henry Sissac, Aline Sullwold, Steve Thompson, Richard Treat, Stephen Turner, Byran Walker, Edward Watts, Roland Williams, Terry Winchester and Malcom Wood.

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Study led by Marshall scientist Dr. Ron Elsner

## Chandra looks back at Earth

*From the Smithsonian Astrophysical Observatory*

Led by Dr. Ron Elsner of the Marshall Center, a team of scientists has scanned the northern polar region of Earth with NASA's Chandra X-ray Observatory. The results show that the aurora borealis, or "northern lights," also dance in X-ray light, creating changing bright arcs of X-ray energy above the Earth's surface.

While other satellite observations had previously detected high-energy X-rays from the Earth auroras, the latest Chandra observations reveal low-energy X-rays generated for the first time during auroral activity.

The researchers used Chandra to observe the Earth 10 times over a four-month period in 2004. The images were created from approximately 20-minute scans during which Chandra was aimed at a fixed point in the sky and the Earth's motion carried the auroral regions through Chandra's field of view.

From the ground, the aurora are known to change dramatically over time, and this is also the case in X-ray light. To illustrate these changes, the X-rays in the sample of the Chandra observations were superimposed on an approximate representation of the Earth.

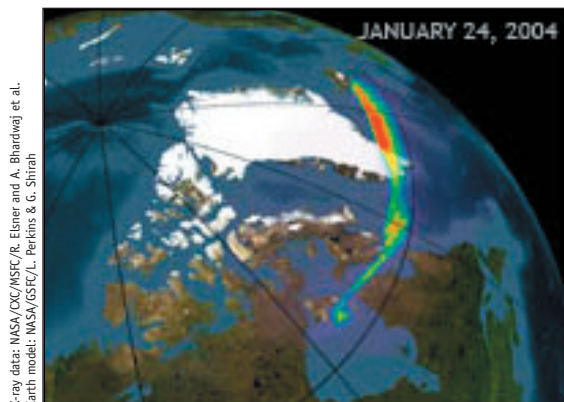
Auroras are produced by solar storms that eject clouds of

energetic charged particles. These particles are deflected when they encounter the Earth's magnetic field, but in the process large electric voltages are created. Electrons trapped in the Earth's magnetic field are accelerated by these voltages and spiral along the magnetic field into the polar regions. There they collide with atoms high in the atmosphere and emit X-rays. Chandra has also observed dramatic auroral activity on Jupiter.

Dr. Anil Bhardwaj is the lead author on a paper describing these results in the *Journal of Atmospheric and Solar-Terrestrial Physics*. Bhardwaj was a co-investigator on the project and worked at the Marshall Center while the research was conducted.

The team also includes researchers from Southwest Research Institute in San Antonio, Texas; the University of Bergen in Norway; the University of Michigan in Ann Arbor; the University of Kansas in Lawrence; the University of Alabama in Huntsville; and NASA's Jet Propulsion Laboratory in Pasadena, Calif.

The Marshall Center manages the Chandra program for the agency's Science Mission Directorate. The Smithsonian Astrophysical Observatory controls science and flight operations from the Chandra X-ray Center in Cambridge, Mass.



One of several Chandra X-ray views of Earth's polar region, shown on a simulated image of the Earth.

## Marshall's Dr. Daniel Dorney receives NASA Space Act Monetary Award

*By Lori Johnston Meggs*

Dr. Daniel Dorney, a Marshall Center aerospace engineer, has received a NASA Space Act Monetary Award for developing software that predicts the flows in rotating turbomachinery components.

The awards program recognizes inventions and other scientific and technical contributions that help achieve NASA's aeronautical, commercialization and space goals. To accomplish these objectives, NASA's Inventions and Contributions Board can recommend granting monetary awards.

Dorney developed the software with co-author Douglas Sondak of Boston University. Both men received a monetary award from the board.

"We are pleased to receive this honor," said Dorney, who works in the Propulsion Delivery Fluids Branch of the Engineering Directorate. "It's rewarding to see something you work so hard to invent being used for turbomachinery design and analysis by industry and government agencies."

Entitled "CORSAIR Three-Dimensional Unsteady Viscous Flow

*See Dorney on page 8*



Marshall's Daniel Dorney, center, holds his NASA Space Act Monetary Award for the CORSAIR software. Marshall Deputy Director Charles Chitwood, left, presents the award as Dorney's wife Suzanne, a Marshall engineer, and James McGroary, Marshall's patent counsel and awards liaison officer, look on.

# **2005: A Year of Exploration Milestones**

NASA completed a successful year of milestones and discoveries in 2005. The agency has begun to implement the Vision for Space Exploration, America's long-term plan for returning astronauts to the moon to prepare for voyages to Mars and other destinations in the solar system. The year included returning the space shuttle to flight, the announcement of plans for America's next generation spacecraft and numerous scientific milestones. Some of the top stories for year in space exploration include:

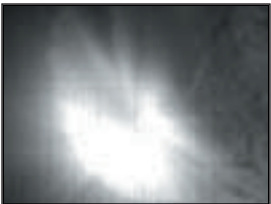


## **Space shuttle returns to flight**

Space shuttle Discovery successfully completed a complex flight, the first mission since the Columbia accident in 2003, to the International Space Station. The mission included breathtaking maneuvers, spacewalks and tests of new procedures and safety equipment. The flight was successful, but engineers are still concerned about external tank insulating foam. NASA is committed to solving this problem before launching the next shuttle mission.

## **NASA's next generation spacecraft**

NASA announced plans for its next generation spacecraft and launch system, which will be capable of delivering crew and supplies to the International Space Station, carrying four astronauts to the moon and supporting up to six crewmembers on future missions to Mars. The new crew vehicle will be shaped like an Apollo capsule, but will be significantly larger.

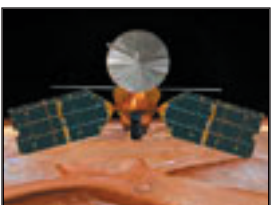


## **Deep Impact encounters comet**

The Deep Impact spacecraft traveled approximately 268 million miles to meet comet Tempel 1. Its impactor collided with the target's nucleus, giving researchers the best-ever comet data and images.

## **International Space Station marks five-year milestone**

NASA and the 15 international station partners marked the fifth anniversary of continuous crewed operations in November. NASA scientists have gathered vital information on the station that will help with future long-duration missions, as the station has a unique microgravity environment that cannot be duplicated on Earth.



## **New Mars Recon Craft successfully launched**

NASA's latest Mars mission, launched Aug. 12, will rendezvous with the red planet on March 10, 2006. The Mars Reconnaissance Orbiter will view the planet from low orbit and provide more data than all previous Martian missions combined.

# Marshall Center astronomers spot rare lunar meteor strike

By Rick Smith

Throughout the year, meteor storms treat space enthusiasts to free fireworks displays — flashy but harmless light shows that occur when solar system tourists such as the Leonids or the Perseids crash into Earth's atmosphere, leaving brief streaks of light to mark their passage.

But what happens when one of these tumbling meteoroids strikes the moon?

In November, astronomers at the Marshall Center recorded just such an event, northwest of Mare Imbrium, the moon's "Sea of Showers."

These small but powerful meteoroid strikes are not uncommon, but it was only in 1999 that scientists first recorded a lunar strike as it happened.

"People just do not look at the moon anymore," said Dr. Robert Suggs, Space Environment team lead in the Natural Environments Branch of Marshall's Engineering Directorate. "We tend to think of it as a known quantity. But there is knowledge still to be gained here."

As NASA plans to return to the moon, the agency seeks to understand how lunar impacts could affect long-term human missions on the surface. On Earth, the atmosphere vaporizes most small meteoroids. The vacuum environment on the moon, however, means there is nothing to slow incoming meteoroids before they strike.

"The likelihood of being struck by a meteoroid on the lunar surface is very, very small," said astronomer Dr. Bill Cooke of Marshall's Meteoroid Environment Office. "The challenge is learning what happens to high-velocity ejecta, the debris kicked up by a strike, which is not hindered by atmospheric friction or Earth gravity. What threat does that debris pose to humans or equipment?"

Suggs used commercial software tools to study the video frame by frame, and spotted a very bright flash. The light gradually faded over the course of five video frames, each one-thirtieth of a second in duration. Suggs called in Cooke, and both scientists agreed it was an impact flash, captured by video from some 248,000 miles away.

Consulting star charts and lunar imaging software, the researchers determined the meteoroid was likely a Taurid, part of an annual

meteor shower active at the time of the strike. Based on the amount of light produced, the object was roughly 5 inches in diameter, traveling more than 60,000 mph, and may have gouged a 10-foot-diameter crater out of the moon's surface.

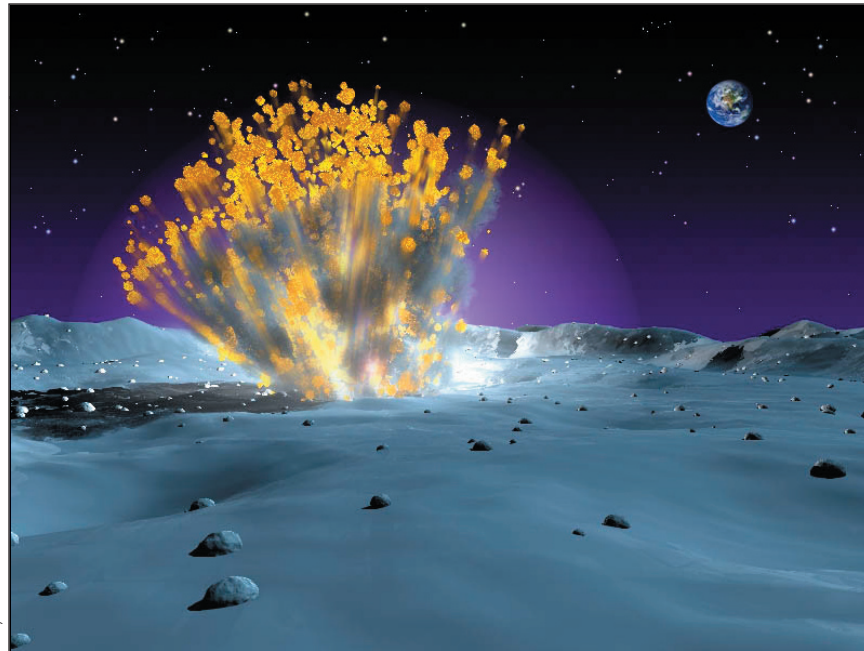
NASA scientists previously studied lunar meteor strikes during the Apollo moon program, but lacked the sophisticated video cameras and high-powered image processors to capture the tiny, telling flashes.

Now, as NASA prepares to send explorers back to the moon for potential long-term stays, Suggs and Cooke say lunar impact

research is more vital than ever.

"Large-scale lunar facilities are sure to be well-protected, using impact-resistant technologies much like those developed to shield the space shuttle and the International Space Station," Suggs said. "We want to support additional measures that safeguard personnel working in the lunar field — early-alert systems, emergency protective measures and new technologies that

will mitigate risks from



An artist's rendering of a typical lunar meteoroid strike.

flying impact debris."

The space environment team is looking at opportunities to conduct further lunar impact studies, providing data and insight to NASA's Robotic Lunar Exploration Program. The program anticipates launching automated lunar missions as early as 2008, paving the way for subsequent human expeditions just a few years later.

"The moon is the future," Cooke said. "If we can resolve the questions associated with meteor impacts before a single person sets foot on the lunar surface, that's one less thing to worry about, and more time to spend charting an unexplored frontier."

Founded in 2003 by the Office of Safety and Mission Assurance, the Meteoroid Environment Office supports NASA's effort to mitigate meteoroid concerns for all space-based activities — primarily the space shuttle and International Space Station. The lunar research team includes Marshall aerospace engineer Heather McNamara, Raytheon Systems scientist Wesley Swift and Morgan Research analyst Danielle Moser.

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# Classified Ads

*To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue is 4:30 p.m. Thursday.*

## Miscellaneous

Early 1960s BB guns, lever-action, 1894s, Buffalo Bill, Daisy octagonal barrel w/original box, \$80-\$225. 303-3702

Trundle bed w/mattress, \$50; bookcase, \$30; king mattress set w/frame, \$100; baby stroller, \$40. 603-3558

New Rawlings OLB3 official size and weight baseballs in ball bucket, 12 balls, \$20. 256-828-1234

Jeff Gordon replica race car hood, new in box. 256-506-3236

Coleman MAXA 5000 extended run generator, 10HP Tecumseh, \$275. 828-6213

One registered Larry Dyke and two Steve Polomchak lithographs. 551-1044

Diamond ring, .9 carat platinum/gold, EGL certified, \$4,000; wedding band w/6 diamonds, \$1,000. 837-3672.

Antique Victorian living room set: marbletop tables, sofa, chair, lamps, plant stand, cornice board, \$1,850. 256-232-7676

Sofa, leather, tan color, \$450. 256-746-8289

Purebred German shepherd, 1 yr., not spayed, \$200, moving, must find good home. 256-457-8051

Summit Goliath tree-stand, \$200. 714-3769

Pioneer Elite rear-projection TV, 55", \$500; Two Klipsch loudspeakers, \$300 each; Klipsch sub-woofer, \$200. 679-1681

La-Z-Boy recliner couch, black, \$200; La-Z-Boy swivel/rock recliner, dusty burgundy, \$85. 881-5093

Gossen "Sixticolor" lighting color balance meter w/case & copy of manual, \$100. 518-9023

Berkley Lightning Fishing Rod w/Abu Garcia 704 Cardinal spinning reel, \$40. 883-1003

GE TV, 31"; shelf for 150 lb. TV; Sony Progressive Scan DVD player. 461-6337

Lexington 9-piece Mahogany bedroom set includes queen rice bed w/foundation, \$1,700. 883-7089

Mink coat by Hening Furs, extra large, black, between hip & knee length, \$975. 771-0061

Camper shell for 89 Ranger LWB, may fit others, stored inside, purchased new, \$200. 256-350-5836

Nikon 7.1MP digital camera w/1 gig SD memory card, \$400. 347-4804

La-Z-Boy recliner sofa, green leather, \$200. 852-5010

Taurus PT908 9mm compact pistol, \$180. 723-4103

Two large computer desks, \$35 each; 4-drawer filing cabinets, \$40; 772-1870

Peavey Blazer 158 Trans-tube guitar amplifier, \$75; Crate GX-15 guitar amplifier, \$50. 256-216-8868

Antique wardrobe, \$200; antique cabinet, \$150. 348-7146

SunQuest 16E tanning bed w/extra lamps, \$1,000. 859-1188

Fiberglass shell for full-size, short bed pickup, needs rear window, \$150. 961-1282

Lopi wood burning stove and accessories, \$400. 256-325-9007

Weed-eater blower/vacuum for parts, Model BV1850, 24cc, \$10. 772-7845

Nike Shox TL 3, men's size 6.5, new in box, red & black, \$75. 533-5942

Miniature Schnauzer, female, black, AKC registered, 4-months old, \$350. 356-464-9055

Evenflo Easy Comfort stroller, \$20; water cooler, \$50; twin/full metal bed frame, \$10. 655-6293

Trampoline, 14' diameter, \$100. 830-2806

Ruger "Old Army" stainless cap and ball revolver, \$300. 851-8085

Dinette set, Oak laminate and chrome legs table w/leaf and four chairs, \$75. 971-0571

Tanning bed, 1.5 years old, 20 bulbs only 3 months old, facial tanner. 256-586-2994

Glass-topped Oak coffee table, \$75. 351-9467

Longaberger 2000 Cheers basket, \$72. 509-2536

Royal commercial upright vacuum, \$200. 883-1667

Security light w/dusk sensor, 2 bulbs, \$20; wooden swing-set, treated lumber, you haul, \$30. 885-2448/Chuck

Star Trek Voyager plastic models, Maquis Kazon & Kazon Torpedo, \$15 each. 880-7118/Mark

Two tickets for "Evita," Feb. 4, 8 p.m., VBC Concert Hall, front row, \$50 each. 882-3777

Oak bunk beds w/mattress & box springs, 2 large storage drawers, \$425. 256-503-2216

Console piano, \$400; two plots, Huntsville Memory Gardens, \$2,000; Pfaltzgraff stoneware w/accessories, \$60. 256-881-4067

Elliptical trainer, stair stepper, and air walker. 684-2256

Olympus C-400 4.0 digital camera w/2 memory cards, \$175; soft-side Jeep door, 97, \$35. 417-2654

Refrigerator, 19 cu. ft.; two king beds; two wood tables, side, 24"x40," expandable pub, 36"x36". 233-0705/Dollman

Futaba 8-channel model airplane radio, Model 8JN, never installed, \$100. 656-2951

Ruger Mini-14 rifle, 6-twenty round mags, 500 rounds, Ghost ring sight, pistol grip, \$675. 256-651-4313

2003 Epiphone Casino w/hardshell case, rarely played, still has factory strings, \$570. 746-9080

## Vehicles

1999 Toyota Rav4, 4-door, 5-speed, 2WD, 88K miles, red, extras, \$7,500. 729-8089

2005 Toyota Camry, 20K miles, \$15,800. 961-9785

2000 Nissan Frontier crew-cab, automatic, CD/cassette, 97K miles, silver, \$10,700. 880-9025

2002 Forest River Shamrock expandable travel trailer, 23', sleeps 8, loaded, slide, anti-sway hitch, \$11,900. 874-7874

2004 Ford F150 Supercab, 5.4L/V8, tow-package, LineX, 6-disk CD, 37K miles, \$19,250. 880-9754

2001 Chevy Silverado, ext. cab, V8, hunter green, loaded, 98.5K miles, \$11,500 firm. 714-7852

2003 Honda VTX 1300cc motorcycle, red, foot rests, saddlebags, windshield, crash-bars, 8K miles, \$7,980. 509-7752

1999 Ford Explorer 4X4, 4 door, 80K miles, \$7,500. 353-3229

2004 Honda Civic EX, 4-door, \$16,000. 233-6197

2004 Ford Explorer XLT, 4WD, fully loaded, Third Row, 30K miles, \$19,900. 797-1730

2004 Honda Civic EX. 233-6197

1998 Mitsubishi Gallant ES, 4-cyl., auto, 115K miles, \$3,350 firm. 256-572-1867

1986 Subaru GL-10, AT, air, new tires, silver, approx. 125k miles, best offer. 256-684-6541

1999 Mercedes SLK 230 convertible, silver w/black & red leather, Sports package, 64K miles, \$17,500. 656-0043

1999 Ford Expedition, black, tow package, 145K miles, third seat, new brakes, \$8,500. 694-5911

1992 Chevy C1500 pickup, V6, long bed, CD, ps/pb, automatic, bedliner, \$1,800. 508-0691

2003 Toyota Tacoma, X-cab, black, V6, 5-speed, TDR off-road, SR5, all-power, 51K miles, \$16,000. 325-8958

1994 Dodge Dakota SLT extended cab, automatic, a/c, power, stereo, hitch, 109K miles, \$3,500. 656-8409

1993 Chevy handicap Hi-top conversion van, 105K miles, TV/VCR, electric lift, V6, \$6,250. 426-5404

## Wanted

Used treadmill, good condition. 256-655-2939

Tape recorder, reel-to-reel type, in good working condition. 830-1905

Used 3-ton or larger heat pump, reasonably priced. 233-4580

Jack Russell dog, male or female. 256-593-7207

## Lost

Crystal earring in shape of Christmas tree, lost in Bldg. 4200. Call 233-4574/Belinda if found

Men's glasses with brown frames. 536-6228

Eyeglasses somewhere in Bldg. 4203, 5th or 6th floor area. 544-5182

Silver and amber ring in or near Bldg. 4708 before Christmas. 864-3236

Hearing aid, in exercise facility. 883-2948 if found

## Found

Silver All-Steel key, medium-sized, rounded, in south parking lot of Bldg. 4200. Call 544-0021 to claim/identify

Money and a glove. Please call 544-3623 to identify/claim

## Free

Two tires, Goodyear Integrity 225/60R16, 7/32" tread remains, fits Towncar, Mark8, Crown Victoria, etc, free. 520-3874

English Setter, 6-months old, female, playful, needs love and attention. 652-0598

## Joint Visitor Control Center scheduled to open Jan. 17

Beginning Jan. 17, Marshall visitors will be required to process through the newly constructed Joint Visitor Control Center, located on Rideout road, north of Gate 9. For more information, see Inside Marshall.

## Shuttle Buddies to meet Jan. 23

The Shuttle Buddies will meet at 9 a.m. Jan. 23 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757.



NASA

## U.S. Air Force-NASA team tests demonstrator engine for future launch vehicles

A stream of fire and smoke gushes from a technology demonstrator engine during testing Dec. 15 at NASA's Stennis Space Center near Bay St. Louis, Miss. The engine, the Integrated Powerhead Demonstrator, was developed to demonstrate advanced rocket technologies for future launch vehicles. The test lasted approximately 7.6 seconds, with engine chamber pressure reaching 89-percent power level. The project will continue testing this

month. Integrated Powerhead Demonstrator is a joint project managed by the U.S. Air Force Research Laboratory at Edwards Air Force Base, Calif., and the Marshall Center. The Integrated Powerhead Demonstrator combustion chamber technology will be used to support development of the expendable upper stage engine, RS25E, for the Crew Launch Vehicle project, managed by NASA's Exploration Launch Office at Marshall.

## Dorney

### Continued from page 4

Analysis," the software is a flexible code that includes modeling for jet-engine, rocket-engine and air-handling systems. CORSAIR also won Marshall's 2005 Software of the Year Award.

The software has been used for design, analysis and anomaly investigations, including main-engine candidates for a second-generation reusable launch vehicle. It is being used to design and analyze all Marshall turbine systems with rotating parts. More than 25 companies and universities are using the software.

Dorney received his bachelor's and master's degrees in aeronautical and astronautical engineering from the University of Illinois in Champaign-Urbana and a doctorate in aerospace engineering from Pennsylvania State University in University Park. He joined Marshall in 2000.

For additional information regarding Space Act awards, please contact Marshall's Office of Chief Counsel at 544-0014.

*The writer, an ASRI employee, supports the Public and Employee Communications Office.*

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